

UNITED STATES
DEPARTMENT OF LABOR
MINE SAFETY AND HEALTH ADMINISTRATION

REPORT OF INVESTIGATION

Surface Nonmetal Mine
(Limestone)

Fatal Machinery Accident
September 7, 2007

Canarico Quarries
Canarico Quarries, Inc
Santa Isabel, Juana Diaz, Puerto Rico
Mine I.D. 54-00159

Investigators

Jose J. Figueroa
Mine Safety and Health Inspector

Jeffrey S. Moninger
Mechanical Engineer

Alan Coburn
Mine Safety and Health Specialist

Originating Office
Mine Safety and Health Administration
Southeastern District
135 Gemini Circle, Suite 212; Birmingham, AL 35209
Michael A. Davis, District Manager



OVERVIEW

On September 7, 2007, Nelson V. Sanchez, supervisor, age 54, was fatally injured when the track loader he was operating left the edge of the road and traveled down a steep grade, and rolled over coming to rest on its side. Sanchez was not wearing a seat belt at the time of the accident and was ejected from the cab of the track loader.

The accident occurred because management failed to ensure that persons could safely operate mobile equipment. The toxicology laboratory report found the victim's blood alcohol was 0.20 percent. This level is evidence of impairment which contributed to the accident. The failure of the driver to wear a seat belt contributed to the severity of his injuries.

GENERAL INFORMATION

Canarico Quarries, a surface crushed limestone operation, owned and operated by Canarico Quarries, Inc., was located on Road 552, Guayabal Ward, Juana Diaz, Puerto Rico. The principal operating official was Eng. Jose A. Vazquez, plant manager. The mine normally operated two 8-hour shifts a day, five days a week. Total employment was 57 persons.

The mine consisted of a multiple bench quarry and a mountain top quarry accessed by inclined roadways. After the overburden was removed, the limestone was drilled and blasted in the quarry. Diamond wire cutting machines were used to cut the limestone in blocks. A hydraulic hammer attached to an excavator was used to break the blocks into smaller pieces.

Front-end loaders transferred the material into off-road haul trucks which transported the raw material to the plant stockpiles at the bottom of the mountain. The material was crushed, sized, screened, and stockpiled. Finished products were sold for use in the construction industry.

The last regular inspection at the operation was completed on March 15, 2007.

DESCRIPTION OF ACCIDENT

On September 6, 2007, Jose A. Vazquez, plant manager, Ismael Rosello, assistant plant manager and Miguel Cruz, blasting supervisor, instructed Angel T. Rodriguez, bulldozer operator, to improve the drainage on the main access road, referred to as Ice Cream Road, to the quarry extraction area. Rodriguez used a dozer on the work road. Some of the material that was removed was placed at the entrance of a secondary road, referred to as Los Vaqueros Road, creating a steep slope. Rodriguez then spread this material on approximately 70 feet of the secondary road because the road was seldom used.

On September 7, 2007, the day of the accident, Nelson V. Sanchez, (victim) reported for work about 8:00 a.m. although his normal shift had started at 7:00 a.m. After Sanchez arrived, he went to the plant area and started to move a track loader to the top of the mountain extraction area where he was assigned to prepare an area for the dimension stone wire cutting machine.

About 9:00 a.m., Rosello was performing maintenance at the primary crusher and saw Sanchez on the track loader on his way to the extraction area. Earlier that morning Rosello had transported persons to the extraction area and observed that a section of the access road was rough and needed to be improved. He

radioed Cruz and asked him to tell Sanchez to smooth the access road with the track loader. Cruz drove down the access road, met Sanchez near the work area, and gave him instructions regarding the road maintenance job. Cruz also told Sanchez to go to the top of the mountain to prepare the area for the diamond wire cutting machine after he finished the access road.

About 10:30 a.m., Cruz drove on the access road but did not see Sanchez. He thought that Sanchez had finished working on the access road and was working at the top of the mountain. At 1:00 p.m., Cruz transported persons back to the extraction area following lunch and drove to the top of the mountain where he thought Sanchez was working but did not see him. Cruz then drove down the road and stopped at the entrance of a secondary road. He saw some tracks on the secondary road, started to walk down the road, and noticed a disturbed area at the elevated edge of the road. Cruz saw the track loader on its side at the bottom of the elevated slope. This secondary road was the area where material was spread the day before the accident.

Cruz immediately radioed Vazquez and Rosello to report the accident. Vazquez and Rosello traveled to the area and found Sanchez lying on the ground approximately 10 feet away from the track loader. Emergency medical personnel arrived and the district attorney pronounced the victim dead at 2:15 p.m. Death was attributed to multiple trauma.

INVESTIGATION OF THE ACCIDENT

On the day of the accident, the Mine Safety and Health Administration (MSHA) was notified at 2:00 p.m. (ET), by a telephone call from Jose A. Vazquez, plant manager, to Luis R. Valentin, supervisory mine safety and health inspector. An investigation was started the same day. An order was issued pursuant to section 103(k) of the Mine Act to ensure the safety of the miners.

MSHA's accident investigation team traveled to the mine, made a physical inspection of the accident scene, conducted interviews, and reviewed conditions and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management and employees.

DISCUSSION

Location of the Accident

The accident occurred at a secondary road that was not frequently traveled. The victim was operating the track loader on the edge of the secondary road approximately 40 feet from the intersection of the access road. While the victim was operating the track loader, he came too close to the edge of the road, and lost control of the equipment. The track loader traveled approximately 120 feet down a 68% grade, and continued to travel another 15 feet onto the lower section of the secondary road which spiraled down the mountain.

Track Loader

The track loader involved in the accident was a Caterpillar Model 935C Series II Track-Type Loader manufactured in 1993. It had an operating weight of 17,579 pounds and was equipped with a Caterpillar Model 3204, four cylinder, diesel engine.

The track loader was damaged in the accident. The right side near the operator's compartment and the left step for access to the operator's compartment were dented. The Rollover Protective Structure (ROPS) was intact but damaged. There was a 1 ½ inch dent in front of the operator's compartment. Four access handles attached to the ROPS vertical beams were bent. The hydraulic pump for the bucket was cracked.

Bucket Control

The bucket was hydraulically controlled from levers located to the right of the operator's seat. The bucket was tested by raising and lowering it and functioned as designed. After this test, the cracked left hydraulic pump failed and no further tests were performed on the bucket operation. All other operational tests were conducted with the bucket raised and secured.

Steering Control

The steering control consisted of two steering clutches and two band-type brakes that were mechanically applied and spring released. The steering controls were operated by two steering clutch/brake control pedals. The left and right pedals controlled the respective steering clutch and brake. The rate of steering was controlled by how far the pedal was pushed down. Depressing the pedal partially disengaged the clutch for a slow turn and fully depressing it engaged the brake for a sharper turn. The clutch and brake units were located in the drive

assembly for each side of the machine. The steering controls were tested to verify left and right turns in both forward and reverse directions and functioned as designed.

Service and Park Brake Controls

The service and park brake consisted of the same two band-type brakes mechanically applied and spring released as used for the steering control. These brake units were located in the drive assembly for each side of the machine. A single service brake pedal was located between the two steering control pedals. When depressed, this pedal activated both brakes simultaneously without disengaging the steering clutches. Depressing the service brake pedal engaged the brakes and releasing the service brake disengaged the brakes.

The parking brake switch was located on the control panel. To engage the parking brake, this switch had to be flipped downward and the center service brake pedal pushed down until the pedal stopped. The pedal remained in the depressed position. To release the park brake, the operator pushed the center service brake pedal down and flipped the brake switch upward.

The service and parking brakes were tested in forward and reverse and functioned as designed.

Transmission Controls

The transmission had three speeds forward and three speeds in reverse. The transmission was controlled by a T-shaped shift lever located to the left of the operator's seat. The control had a U-shaped shift pattern. One side of the U-shaped shift pattern controlled the forward speeds and the other side controlled the reverse speeds. Moving the shift control from side to side on the U-shaped shift pattern shifted the transmission between forward and reverse. The transmission was in neutral when the shifter was at the bottom between the sides of the U-shaped shift pattern. The shift lever was connected by mechanical linkages to the shift controls mounted on the transmission. The transmission was tested and functioned as designed in forward and reverse directions.

Governor Control

The transmission's T-shaped shift lever controlled the governor. The lever handle rotated to control the engine speed. When the engine was idling, the lever faced forward. When the lever was turned to the right, the speed increased. The governor control was tested and functioned as designed.

Seat Belt

A seat belt was provided in the track loader. It was not damaged and latched and unlatched when tested.

Medical Analysis

The toxicology laboratory report found the victim's blood alcohol was 0.20 percent. This level exceeded Puerto Rico's limit of impairment and contributed to the accident.

Training and Experience

Nelson V. Sanchez had 27 years of mining experience and had worked at this mine for 7 years and 8 weeks operating the track loader involved in the accident the entire time. He had received training in accordance with 30 CFR, Part 46.

ROOT CAUSE ANALYSIS

A root cause analysis was conducted and the following causal factor was identified:

Causal Factor: Management policies and procedures failed to ensure persons could safely operate mobile equipment. The victim's blood alcohol exceeded the legal limit and is evidence of impairment which contributed to the accident. There was no program in place to identify persons who may be operating equipment under impairment.

Corrective Action: Management should implement procedures to identify persons who may be impaired from substance abuse. Employees should be knowledgeable of the company's substance abuse policy and prevention program. Management should consider adopting a random testing policy to ensure persons are not impaired.

CONCLUSION

The accident occurred because management failed to ensure that persons could safely operate mobile equipment. The toxicology laboratory report found the victim's blood alcohol was 0.20 percent. This level is evidence of impairment which contributed to the accident. The failure of the driver to wear a seat belt contributed to the severity of his injuries.

ENFORCEMENT ACTIONS

Canarico Quarries, Inc.

Order No. 6083072 was issued on September 7, 2007, under the provisions of Section 103(k) of the Mine Act:

A fatal accident occurred at this operation on September 7, 2007, when the operator of the Cat 935C, S.N. 5DJ00231 Track-Type Loader was pushing material at the entrance of the road leading to an area called "Los Vaqueros". This order is issued to assure the safety of all persons at this operation. It prohibits all activity at the entrance of the road until MSHA has determined that it is safe to resume normal mining operations in the area. The mine operator shall obtain prior approval from an authorized representative for all the actions to recover and/or restore operations to the affected area.

The order was terminated on September 13, 2007. Conditions that contributed to the accident no longer exist and normal mining operations can resume.

Citation No. 7769482 was issued on November 19, 2007, under the provisions of Section 104(a) of the Mine Act for violation of 30 CFR 56.9101:

A fatal accident occurred at this mine on September 7, 2007, when the track loader that was repairing a roadway traveled over the elevated edge and landed approximately 135 feet below. The equipment operator failed to maintain control of the track loader while working on the road.

The citation was terminated on December 10, 2007. All mobile equipment operators were trained on safe driving practices and maintaining control of mobile equipment.

Citation No. 7769483 was issued on November 19, 2007, under the provisions of section 104(a) of the Mine Act for violation of 30 CFR 56.14130(g):

A fatal accident occurred at this mine on September 7, 2007, when the track loader that was repairing a roadway traveled over the elevated roadway edge and landed approximately 135 feet below. The seat belt provided was not being worn by the loader operator who was found lying outside the operator's cab.

The citation was terminated on November 26, 2007. All miners were retrained on the company's zero tolerance mandatory seat belt policy.

Citation No. 7769500 was issued on January 25, 2008, under the provisions of Section 104(a) of the Mine Act for violation of 30 CFR 56.20001:

A fatal accident occurred at this mine on September 7, 2007, when the track loader that was repairing a roadway traveled over the elevated edge and landed approximately 135 feet below. Toxicology laboratory results indicated the victim's blood alcohol was 0.20 percent and established that the victim was under the influence of alcohol.

The citation was terminated on March 6, 2008. All miners were given extensive training on the company's zero tolerance for being under the influence or possession of intoxicating beverages and narcotics on mine property

Approved by: _____

Michael A. Davis
Southeast District Manager

Date: _____

APPENDICES

- A. Persons Participating in the Investigation
- B. Map of the area
- C. Victim Data Sheet

APPENDIX A

Persons Participating in the Investigation

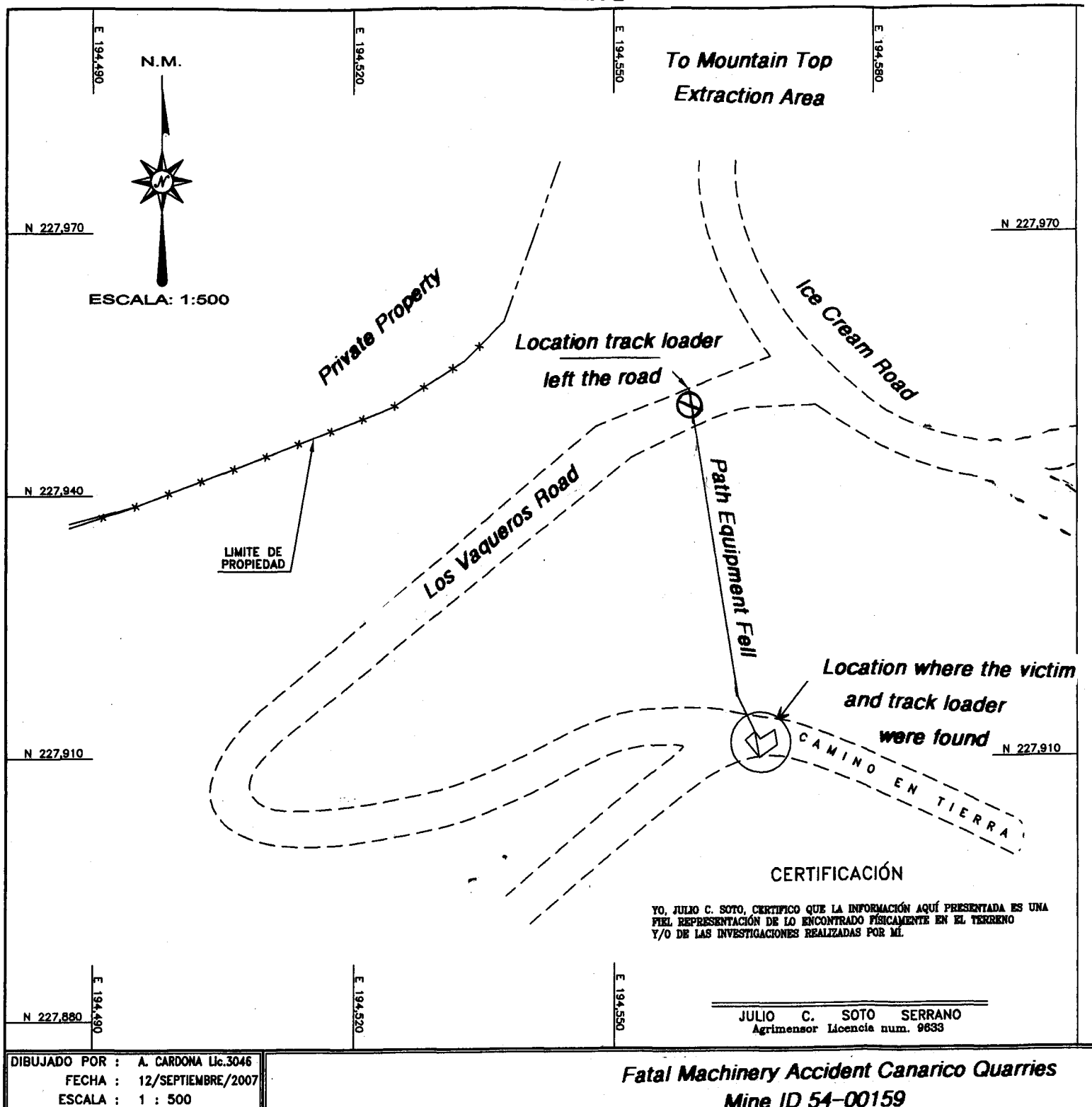
Canarico Quarries, Inc.

Efrain Carreras	chief of operations
Moises Rivera	environmental, health and safety manager
Jose A. Vazquez	plant manager
Ismael Rosello	assistant plant manager
Miguel A. Cruz	blasting supervisor
Herminio Rodriguez	extraction and hauling supervisor
Angel T. Rodriguez	bulldozer operator
Jose Alvarado	mechanic
Jimmy Aponte	mechanic helper

Mine Safety and Health Administration

Jose J. Figueroa	mine safety and health inspector
Jeffrey S. Moninger	mechanical engineer
Alan Coburn	mine safety and health specialist

APPENDIX B



APPENDIX C

Accident Investigation Data - Victim Information

U.S. Department of Labor
Mine Safety and Health Administration

Event Number: 0 9 5 6 1 7 4

Victim Information: 1

1. Name of Injured/III Employee: Nelson V. Sanchez		2. Sex M	3. Victim's Age 54	4. Last Four Digits of SSN:	5. Degree of Injury: 01 Fatal										
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death: a. Date: 09/07/2007 b. Time: 10:00				7. Date and Time Started: a. Date: 09/07/2007 b. Time: 8:00											
8. Regular Job Title: 149 Supervisor			9. Work Activity when Injured: 053 track loader operator		10. Was this work activity part of regular job? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>										
11. Experience a. This Work Activity:	Years 7	Weeks 8	Days 0	b. Regular Job Title:	Years 7	Weeks 8	Days 0	c. This Mine:	Years 7	Weeks 8	Days 0	d. Total Mining:	Years 27	Weeks 0	Days 0
12. What Directly Inflicted Injury or Illness? 076 Track Loader				13. Nature of Injury or Illness: 370 Multiple injuries											
14. Training Deficiencies: Hazard: New/Newly-Employed Experienced Miner: Annual: Task:															
15. Company of Employment: (If different from production operator) Operator Independent Contractor ID: (if applicable)															
16. On-site Emergency Medical Treatment: Not Applicable: First-Aid: CPR: EMT: Medical Professional: None:															
17. Part 50 Document Control Number: (form 7000-1) 18. Union Affiliation of Victim:															

Victim Information:

1. Name of Injured/III Employee:		2. Sex	3. Victim's Age	4. Last Four Digits of SSN:	5. Degree of Injury:										
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:				7. Date and Time Started:											
8. Regular Job Title:			9. Work Activity when Injured:		10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>										
11. Experience: a. This Work Activity:	Years	Weeks	Days	b. Regular Job Title:	Years	Weeks	Days	c. This Mine:	Years	Weeks	Days	d. Total Mining:	Years	Weeks	Days
12. What Directly Inflicted Injury or Illness?				13. Nature of Injury or Illness:											
14. Training Deficiencies: Hazard: New/Newly-Employed Experienced Miner: Annual: Task:															
15. Company of Employment: (If different from production operator) Independent Contractor ID: (if applicable)															
16. On-site Emergency Medical Treatment: Not Applicable: First-Aid: CPR: EMT: Medical Professional: None:															
17. Part 50 Document Control Number: (form 7000-1) 18. Union Affiliation of Victim:															

Victim Information:

1. Name of Injured/III Employee:		2. Sex	3. Victim's Age	4. Last Four Digits of SSN:	5. Degree of Injury:										
6. Date(MM/DD/YY) and Time(24 Hr.) Of Death:				7. Date and Time Started:											
8. Regular Job Title:			9. Work Activity when Injured:		10. Was this work activity part of regular job? Yes <input type="checkbox"/> No <input type="checkbox"/>										
11. Experience: a. This Work Activity:	Years	Weeks	Days	b. Regular Job Title:	Years	Weeks	Days	c. This Mine:	Years	Weeks	Days	d. Total Mining:	Years	Weeks	Days
12. What Directly Inflicted Injury or Illness?				13. Nature of Injury or Illness:											
14. Training Deficiencies: Hazard: New/Newly-Employed Experienced Miner: Annual: Task:															
15. Company of Employment: (If different from production operator) Independent Contractor ID: (if applicable)															
16. On-site Emergency Medical Treatment: Not Applicable: First-Aid: CPR: EMT: Medical Professional: None:															
17. Part 50 Document Control Number: (form 7000-1) 18. Union Affiliation of Victim:															